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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,921	07/31/2003	Jigish D. Trivedi	MICRON.104DV1	9664

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EXAMINER

POMPEY, RON EVERETT

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,921

Applicant(s)

TRIVEDI, JIGISH D.

Examiner

Ron E Pompey

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7-31-03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura (US 4,935,380) in further view of the admitted prior art and Yoo (US 5,605,854).

Okumura discloses the limitations of:

forming a gate stack on a substrate, the gate stack having at least one conductive layer (205, fig. 7A) and a source layer (213, fig. 7A) positioned on top of the at least one conductive layer, the source layer providing a source of transforming atoms (col. 6, ln. 59 – col. 7, ln. 9).

3. Okumura fails to disclose the limitations of:

exhuming a first layer of the gate stack so as to expose a portion of the source layer;

depositing a refractory material on the integrated circuit so that the refractory material contacts the exposed portion of the source layer of the gate stack and so that the refractory material is positioned on another device of the integrated circuit;

transforming the refractory material at the exposed portion of the source layer into a low resistance contact wherein the source layer provides transforming atoms to

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the portion of the refractory material positioned adjacent the exposed portion of the source layer; and

wherein annealing the refractory material comprises exposing the refractory material to a rapid thermal processing environment having an N₂/NH₃ ambient so as to increase the temperature of the refractory material to a value between 600 degrees Celsius and 750 degrees Celsius for a period of time between 10 seconds and 60 seconds.

a. However, the admitted prior art discloses:

exhuming (202, fig. 1) a first layer (216, fig. 1) of the gate stack so as to expose a portion of the source layer;

depositing a refractory material (218, fig. 1) on the integrated circuit so that the refractory material contacts the exposed portion of the source layer of the gate stack and so that the refractory material is positioned on another device of the integrated circuit; and

transforming the refractory material at the exposed portion of the source layer into a low resistance contact wherein the source layer provides transforming atoms to the portion of the refractory material positioned adjacent the exposed portion of the source layer (pg. 1, ln. 28 – pg. 2, ln. 28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the admitted prior art with Okumura, because the first layer protects the gate structure from subsequent process and the refractory material provides an electrical connection between circuit nodes in an integrated circuit.

b. However, Yoo discloses:

wherein annealing the refractory material comprises exposing the refractory material to a rapid thermal processing environment having an N₂/NH₃ ambient so as to increase the temperature of the refractory material to a value between 600 degrees Celsius and 750 degrees Celsius for a period of time between 10 seconds and 60 seconds (col. 4, Ins. 43-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Yoo with Okumura and the admitted prior art, because rapid thermal processing has less effect on the doping concentrations set in the previous process due to less prolonged heat treatment.

EXAMINER'S AMENDMENT

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. James Ausley on 2-18-04.

The application has been amended as follows:


In claim 25, line 6, replace “;” with --. --.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (571) 272-1680. The examiner can normally be reached on flex schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Ron Pompey
Art Unit: 2812
February 19, 2004


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800